

EXHIBIT 11

BenchMark[®] XT Reference Manual

CONFIDENTIAL

VM 000223

BenchMark[®] XT Reference Manual

This manual's Part Number is 2000100 Revision A.

CONFIDENTIAL

VM 000224

Preface

The BenchMark® XT system has hardware, software, and reagent components. The software reference manual covers the software that runs on the personal computer. This manual covers operation, safety information, and maintenance of the BenchMark XT hardware. Details for each reagent product are covered in their respective package inserts.

First, you are given a quick review of the components of a BenchMark XT system, focused on the hardware. The next section, "Basic Instrument Operation," covers virtually all of the hands-on information you need to operate a BenchMark XT instrument on a daily basis.

In "Maintenance" we cover periodic requirements for cleaning, disinfecting, and system checks. The maintenance chores are very important, and you should read, understand, and follow these directions faithfully.

"Test Software" is used not only for troubleshooting, but also in the cleaning and routine maintenance. Other functions are useful to verify that the instrument is performing properly, but do not enter into the normal operation routine.

Copyright © Ventana Medical Systems, Inc. 2003, All Rights Reserved.

CONFIDENTIAL

VM 000225

Basic Instrument Operation

- Reagent dispensers are positioned using a motor driven carousel
 - ♦ A mechanical arm actuates a reagent dispenser positioned over a slide at precisely the right time
 - These and all other mechanical functions within the stainer subassembly are controlled by electronics internal to the stainer subassembly
- The software uses information from the bar codes on the dispensers and the slides to rotate the nozzle plate to the correct position for dispensing, mixing, or removing reagents
 - ♦ As a nozzle, mixer or dispense station passes over a slide, the controller triggers the function appropriate to the slide's protocol
- The stainer subassembly requires
 - ♦ Electrical power
 - ♦ Pressurized air
 - The pressurized air supplied by the AFS is used within the stainer subassembly to mix the fluids on the slides and actuate various valves, cylinders and nozzles
 - ♦ Bulk products
 - These are CC1, CC2, EZ Prep, LCS, Reaction Buffer, and SSC, which are described elsewhere
 - Bulk products are supplied by the automated fluidics subassembly
- Once the stainer subassembly has received instructions from the personal computer and completed its **initialization** it will run autonomously until all slides are stained
 - ♦ See "Initialization Before a Run"
- To learn more about the stainer subassembly's internal operation, see "How BenchMark XT Works"

BenchMark XT Reference Manual

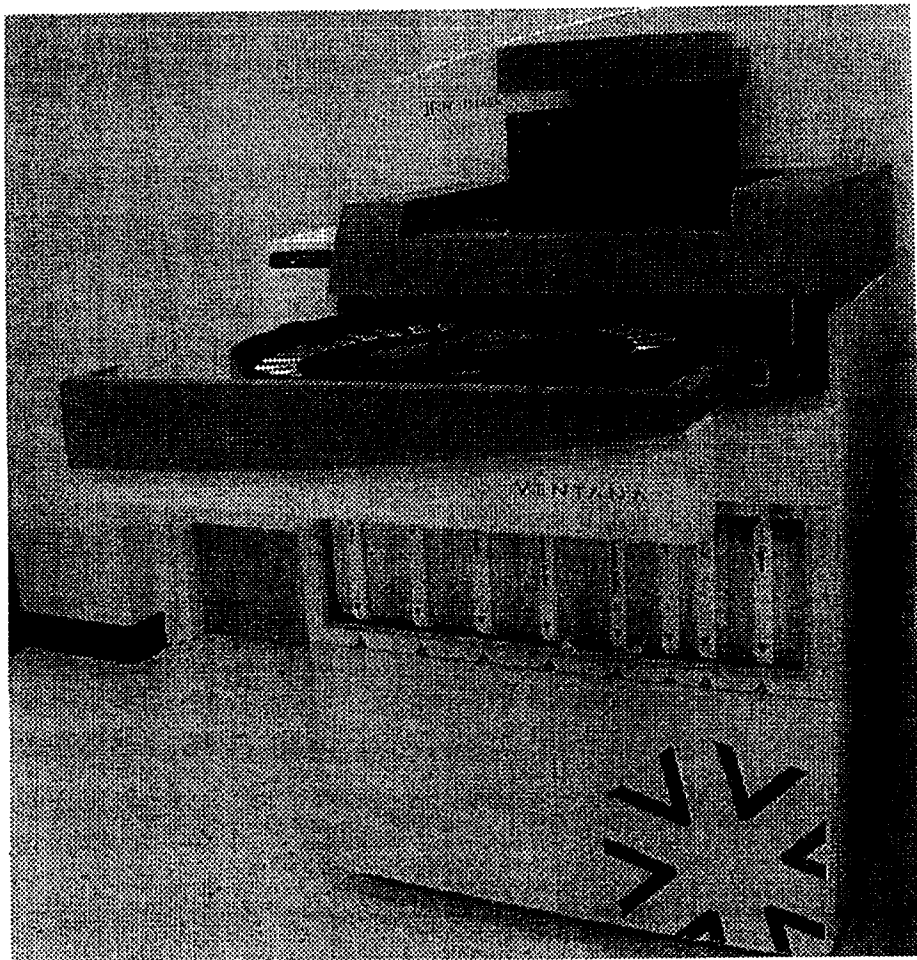


Figure 16. Slide Tray Pulled Out

- The slide tray cannot be pulled out during a run except during titration
 - ♦ This is because the slide tray rises so that the slides surround the nozzle plate
 - When titration is required during the run, the instrument will pause and lower the slide tray
 - ♦ The slide tray can then be pulled out for titration
 - ♦ After titration, the slide tray should be pushed back in and the Run button pushed to resume the run

How BenchMark XT Works

7.8 Temperature Control

Each slide position has a ThermoPad independently controlled by software and user protocols. The ThermoPads are located under the slides and are controlled via by a microcircuit embedded in each ThermoPad.

7.9 Importance of Leveling

As all of the previously described actions occur, with the washers washing, the nozzles and dispensers dispensing, and the vortex mixers stirring, the puddle has to remain intact over the specimen. It must not be spilling over the edge of the slide. So the instrument has to be level.

Leveling is accomplished by a Ventana representative during installation of the instrument.